



# MAGAZINE

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FRONT COVER: "Nasturtiums," by W. H. Wilson (General Chemicals Division)

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GUNPOWDER FOR WATERLOO

Two months ago I.C.I.'s oldest factory closed, after making gunpowder for more than 150 years. Up to the end the mills made gunpowder the old way. The waters of the valley were still harnessed for power; and in the "modern" extension a Watt beam engine still functioned efficiently. Now the cruel task of dismantling begins.

By Michael Danckwerts

TEN miles south of Edinburgh is the perfect "undiscovered" beauty spot for which picnickers are always searching. At the bottom of a densely wooded glen a river tumbles over rocks in sunlight dappled by overhanging trees; families of rabbits skip about, a kestrel hovers beside its nest in the face of a cliff, and a woodpecker calls from a hollow oak.

For more than 150 years this idyllic scene has been reserved for the eyes of a few score men and women—the skilled workers who have made gunpowder at Roslin Mills, a handful of stone buildings scattered through the glen. And although the mills have been closed since June, the notice that has stood at the head of the glen since 1790, "Gunpowder Mills—No Admittance," still stands there to warn off small boys, who might find material for mischief in the abandoned buildings.

Roslin was not only I.C.I.'s oldest factory, but the oldest privately owned gunpowder mill in the country. The decision to close it must have been a hard one for Nobel Division to take. But early this year it became clear that temporary expedients such as shoring up could no longer stave off the subsidence, caused by coal mining, that has been nibbling at the factory buildings since 1942. Roslin was dangerous, and had to close.

It was a sad business for everyone, from the works manager down to the three brass-shod horses that plodded loyally round the works with their wagons of gunpowder. Thomas Crow, the searcher at the gate, had been at Roslin for 30 years; William Russell, the superintending foreman, for 25. Peter Wilson, the joiner, had been there since 1914 and had gone to school from a house in the factory grounds where his stepfather, Thomas Penman, lived. Penman had been superintending foreman in those



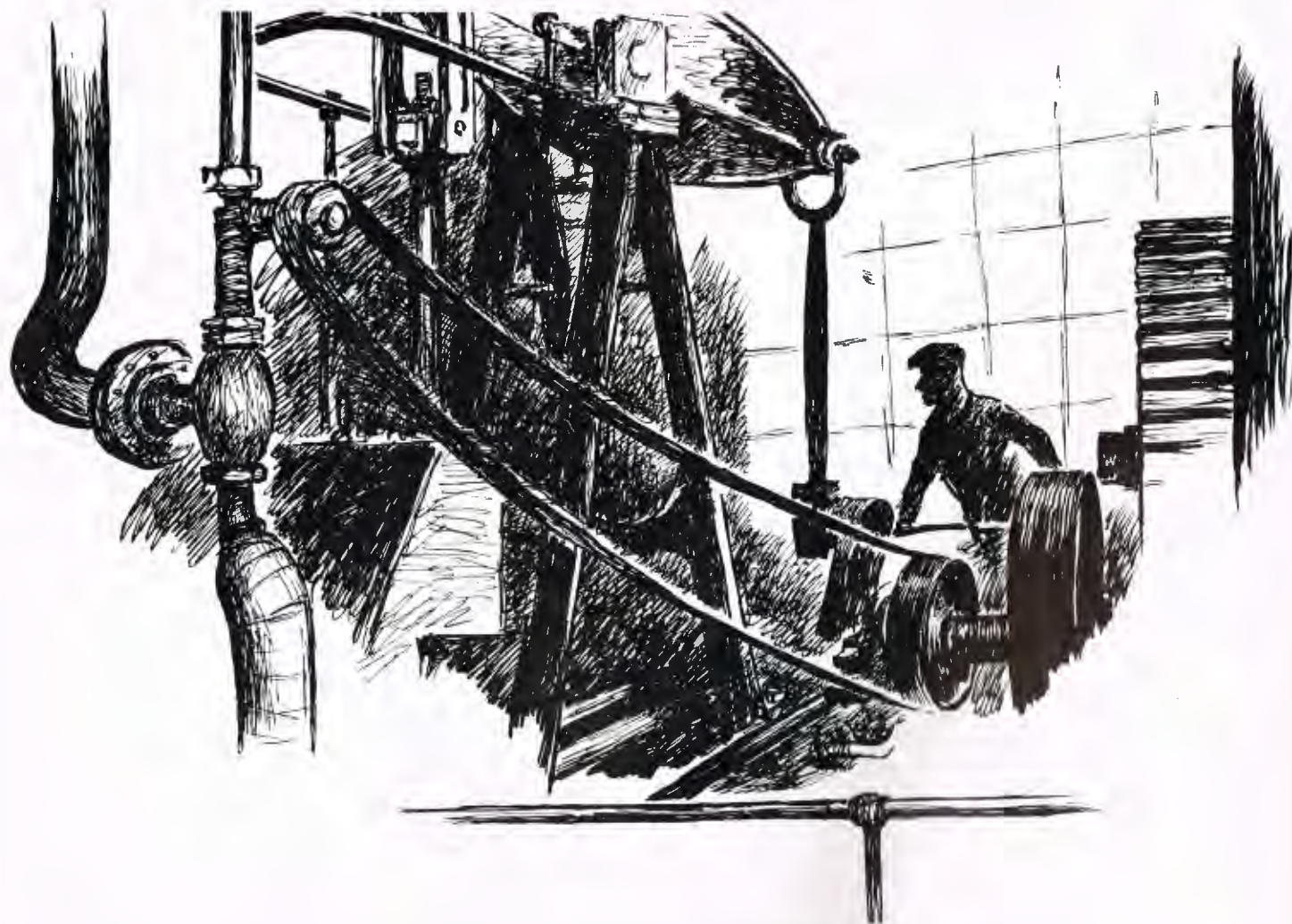
One of the chain of blackpowder processing sheds at Roslin

Drawings by Arthur Horowicz





*Horse-drawn wagons were used for the carriage of blackpowder or its ingredients*



*This steam engine was bought second-hand in 1863 and is believed to date from the earliest days of steam power. It continued working efficiently until the works were closed last June.*



*These edge-runner mills were the heart of the process. Here the mixture of charcoal, saltpetre and sulphur was ground into a fine powder and thus became explosive.*

days, and *his* father had worked at Roslin before him. Peter Wilson told me that in his stepfather's day it had been a factory rule that when the men came to work they combed out their beards in front of the searcher to prove that there were no matches hidden there.

Mr. A. T. Tyre, the works manager, lived in the Adam brothers' house above the glen that John Merricks had built when he started Roslin in 1790 with his partner John Hay. Hay and Merricks' original office building in the works was still intact, though used as a women's changing room. Mr. Tyre pointed out on a rock the figures 1815 carved a foot high. "That means Roslin powder was used at the battle of Waterloo," he said. "Or so the story goes." And it is not difficult to imagine a jubilant powder-maker using his dinner hour to record Roslin's contribution to the famous victory.

The use of Roslin powder for guns had ceased, of course, long before it became an I.C.I. factory. But from a loft above the stables William Russell unearthed a dusty bunch of reminders of the days when the powder was used against game, Boers and Bashi-Bazouks: muzzle-loading and flint-lock guns, kept for testing purposes in the Curtis and Harvey days.

Nowadays blackpowder, as it is called, is used chiefly by shale and slate quarriers, who like its gentle effects best for their blasting work.

No chemical process can have changed so little since 1790 as the making of blackpowder. In twentieth-century Roslin charcoal, saltpetre and sulphur were the three ingredients, as they were in 1790, and, as in 1790, they were wrought into an explosive mixture largely by water power from the river North Esk.

The charcoal, once burnt from







Weighing out the ingredients for the blackpowder mixture, technically known as the "green charge"



Blackpowder is here being pressed into pellets. The demand for blackpowder in pellet form comes chiefly from shale mines.



Blackpowder is chiefly needed in the form of grains. For this the powder at Roslin was first pressed into cakes, which were broken up by hand with a wooden mallet and then further reduced in size by a "corning" machine.



One of the original water wheels dating from 1790. This old paddle wheel drove twin edge-runner grinding wheels, each housed in a separate shed on each side of the wheel.

alder wood growing in the factory grounds, was supplied in recent years from Ardeer with the other ingredients. After a preliminary hand mixing, the ingredients, known as the "green charge," went to incorporating mills. Merriek's original pair of mills driven by a paddle wheel mounted between them, were still in working order when Roslin closed down. But since 1863 four of the mills had been powered by a vast beam engine, bought second-hand and believed to date from the early days of steam. Four other mills were worked by enclosed water turbines.

These edge-runner mills were in effect like gigantic pestles and mortars, the pestle in each being a  $5\frac{1}{2}$ -ton wheel of chilled steel. "Quite a modern machine," Mr. Tyre said, pointing to the date on one of them, which read "Falkirk, 1885." He explained that the milling process was potentially dangerous. An old nail or a few grains of sand in the charge could spell disaster. For that reason there was not only a very strict sieving and magnetic screening of the raw materials, but a charge igniting in one mill would automatically operate a safety device which drenched it and the contents of the other mills.

The next stage in the process, as of old, was to compress the wrought powder into cakes. A modern hydraulic press had taken the place of water power here, and with a pressure of  $1\frac{1}{2}$  tons to the square inch could turn out 30 cakes of powder, each two foot square, every 35 minutes. As the men in the press house removed the cakes they broke them up roughly with mallets. Kegs full

of broken cake then went to the corning house.

Corning—the breaking of cake into grains of exactly the right size—was a process that claimed more than one life in the old blackpowder industry. The original owner of Roslin mill would have been amazed to see what precautions against accidents had been evolved since his day. The corning machine itself, built of wood and non-ferrous metals, was housed in one shed, its engine in another. The processman could not start the engine without leaving the corning shed, and was therefore never in any danger of being near the machine when it was running. Nor could

anyone else start the engine while he was in the shed, for only a unique key, held by him, would unlock the engine compartment. An indicator outside the shed told him when each batch of cake had been corned, whereupon he would stop the engine and re-enter the corning shed.

The uniform grains of powder from the corning machine then went to be glazed with graphite in revolving drums. The polish they acquired made them flow more easily and gave them a certain resistance to water. Part of the output of powder from the incorporating mills, instead of being made into cakes and corned, went straight to the pelleting sheds. Here women workers, operating rotary pelleting presses, turned out brick-hard pellets of compressed powder, used chiefly for blasting in shale mines.

William Russell took me down the lane that ran past the pelleting sheds to the farthest boundary of the works. A main road once ran past the boundary at this point, and an eighteenth-century house that had once been an inn was now inhabited by the works chauffeur, William Mitchell.

In another ancient building William Lorimer, the cooper, worked alone, as he had done for forty years, making kegs from oak staves.

As we walked back up the lane William Russell surveyed the sunlit stretch of river and voiced feelings that must have been shared by many when Roslin closed down. "Look at the beauty of it!" he said. "I could have worked here happily all my days."





# Information Notes

## THE AMERICAN MARKET HANDICAP STAKES

By Michael Clapham (Metals Division)

*Mr. Michael Clapham, joint managing director of Metals Division, has recently returned from a 6000-mile tour of the United States. Here he describes some of the problems involved in selling I.C.I. non-ferrous metal products in America.*

SELLING metal to the United States market is rather like running in the Grand National. There are big prizes at stake, but the going is hard and there are a lot of fences to clear. The prizes are large orders of the sort Metals Division welcomes and—no less important—dollars to help the country's finances. The course is the biggest consumer's market of the world in terms of purchasing power.

Unfortunately there are several other good horses in the race. First of all, there are the Americans themselves; whatever happens, they are bound to win this race by a very long way, and we can only compete for a place. There are the Canadians—efficient producers with copper supplies on their own doorstep and wonderfully placed for access to the United States market. Then come the Germans, who are trying as hard as we are to build up a permanent export market and who tend to manufacture at a lower cost than we do. So, too, do the Belgians and the Swiss and one or two other European nations, and it may not be long before they are joined by the Japanese.

Let us have a look at the fences. First, there is the matter of time and distance. From Liverpool to New York is 3100 miles, from Liverpool to San Francisco nearly 8000 miles. Before we can sell goods in America we must pay the cost of shipping them these immense distances and insuring them en route; as some delay in transit is inevitable, we have to chance the price of copper falling while the goods are on the way—and that might mean losing £10 or £20 a ton. Our customers, on the other hand, have to face the risk of delays through bad weather or port difficulties.

The second fence is taxation. Any profits made by trading in the U.S. would be subject to U.S. Federal and State taxes. Federal taxes would not affect I.C.I. in the end, as anything

paid on this account would be taken into account in I.C.I.'s liability for British tax. State taxes are not covered by this arrangement, and of course all taxes in U.S.A. have to be paid in dollars.

The way to avoid this is to sell outright to an American company which must have full possession of the goods before they actually enter the United States and is then free to do all the selling on its own account. If you do it this way, the great thing is to pick the right company to do the job.



... some delay in transit

The third fence is that American industries tend to use qualities and specifications of materials slightly different from those we normally sell at home. The special manufacturing problems involved present only minor difficulties, but they bring us face to face with the next fence. This is our lack of contact with customers who may be 3000–5000 miles away and the great difficulty of finding out exactly what they want and how they are intending to use it, so that we can be sure of supplying the right thing. It is, of course, very expensive to make a mistake if you may have to pay the carriage both ways!

Now we come to the Becher's Brook of the whole course—American tariffs. It is only fair to say that American public opinion on this subject has changed a great deal since the war, but it is still true that on almost every product we make there is a tariff of one sort or another. About the lowest on any

product is £16 a ton, but some have a tariff of £24 or even £32 a ton and some have a duty related to their value, which may give you a tariff as high as £70 or £80 a ton. Even with the lowest tariffs we must be exceptionally efficient if we are to pay the freight and the tariff and still sell at a competitive price.

That brings us to yet another fence, which is the fact that the American buyer does not naturally look to get his supplies from abroad. Particularly in areas where only one man in a thousand has ever seen the sea, the idea of buying material from Birmingham, England, seems as odd as it would seem to us to place our orders in Timbuktu. To make any impression at all on this market we have to sell cheaper than the Americans, make products as good as or, if possible, better than theirs, and prove that, in spite of the immense distances, we can keep up a delivery service as regular and reliable as they could expect from their own mills.

In spite of all this, we have some things on our side.

First of all, the firm handling our metal products is a first-rate one with long experience on the raw metal side. This firm, C. Tennant Sons & Co., has offices on both the east and the west coast and an able and energetic staff. Secondly, in some of our products (particularly cold rolled sheet and strip) our quality is recognised as being higher than the American mills produce, so that once we get our products established people go on asking for them. Thirdly, there are some places

where we are not much handicapped by transport costs.

For example, although it is 8000 miles from England to the west coast by sea, it is the best part of 3000 miles across the continent from Connecticut, where most of the American brass and copper mills are, to California, where a good many of the products are used, and the rail freight is as much as the sea freight. Finally, we are, of course, only trying to get a



... the going is hard

very small proportion of the market. To change our racing metaphor, United States demand represents such a large cake that even a thin slice would provide us with a pretty satisfying meal.

Metals Division sees the American market as a challenge. To make any headway we have to manufacture as well as or better than the Americans and to sell cheaper after paying freight and tariffs. We do it in some products already, and we

intend to do it in many more. It is a challenge primarily to management, but to some extent to every man who makes or inspects or packs the material we ship across the Atlantic Ocean.

## THE COST OF RESEARCH

*At the Annual General Meeting of the Company on 17th June, the Chairman, Dr. Alexander Fleck, had some pointed remarks to make about the attitude of the Ministry of Health towards the cost of pharmaceuticals required by the National Health Service. His words were as follows.*

ANY effort by a government department to cut down waste and extravagance is commendable, said Dr. Fleck. In this instance, however, there is the serious danger that a rather unintelligent application of quite inappropriate costing methods may damage or even destroy the most vital parts of the pharmaceuticals industry in this country.

The danger is that pharmaceutical research may be rendered so unattractive in this country and so unprofitable that this important field of research may be abandoned by one company after another, and this country may be forced to rely upon the scientific achievements of other countries. Research for new drugs is, and must remain, highly speculative; only a small part of the research effort can ever be directly fruitful, but when success is achieved the cost of all the work which had proved fruitless for its original purpose must be taken into account.

The profit on the successful discovery must cover the cost of the unsuccessful research if any concern is to be encouraged

to carry on this speculative but valuable work. Even the successful product may hold the field for a short time only and be replaced by some other product discovered either in this country or overseas.

Costing principles permitting a very limited percentage of profit on the manufacturing cost of a commodity may no doubt be appropriate and proper in some cases, but I suggest that in the case of drugs which it is decided to produce and which the National Health Service wants, the rigid and unimaginative application of such principles will lead to results that are unfair to the industry. I would again emphasise that the true cost of the drug includes, as well as other overhead expenditure, the cost of much patient scientific effort spread over many years and many possible products.

I regard this danger—that is, the application of inappropriate costing methods to an important section of industrial scientific research in this country—as serious; and I trust that in this matter greater wisdom will prevail.



# LIFE IN BANGKOK

By G. M. Graham (Dyestuffs Division)

*Siam (officially called Thailand) may not be in the news today, but the problems of its security are certainly in the minds of statesmen as a result of the rapid advance of the Chinese Communists in Indo-China. Here is a vivid impression of what life is like in Siam's capital, Bangkok.*

WE took the steamer from Singapore and sailed up the Gulf of Siam until we came to the group of rocky islands called Koh-si-Chang near the mouth of the great Menam River.

Here, because the river is too shallow, it was necessary to transfer to a launch—a fascinating six-hour river journey past palm-fringed banks and isolated coloured pagodas standing among the brilliant green of the new ricefields which brought us to Bangkok.

It was soon clear that we were indeed in the heart of the "mysterious East," and that our so-called western civilisation had not penetrated very far here.

The city of Bangkok covers a large area, and most of the buildings are of wood. Through busy narrow streets—whose surfaces are not recommended for many English cars—we passed over bridge after bridge, under bright blue skies and in steamy heat, to reach our house in the far suburbs.

One could not help noticing the great number of Buddhist priests in the streets with their shaven heads and toga-like yellow robes; and it was learned that in Siamese families it is the "done thing" to send their young sons into the priesthood, generally for just a year or two. The young man must provide

his own bed-mat, robes and cooking pots, and when he returns to "civilian life" these articles are donated to his particular temple.



Our house stood in a large garden, where there was a profusion of lovely blossom such as jacaranda and hibiscus, while the house itself was almost enveloped in pink bougainvillea. We were amazed to see in the middle of the garden a lake and on three sides of it wide ditches full of water called klongs. So low-lying is Bangkok, and indeed the surrounding hundreds of square miles of rice-growing country, that whenever a house or a road is to be constructed the surrounding land must first be excavated, the earth being taken out and built up as a platform on which to build. This, then, was the explanation of all the hundreds of canals and little hump-backed bridges we had passed and, of course, of the lake and klongs in the

garden—indeed, Bangkok has been referred to as the Venice of the East.

The general effect was exceedingly beautiful, but there can be danger, or at least discomfort, in beautiful things in the East. The klongs fill up with stagnant water which are breeding

places for literally clouds of mosquitoes—luckily not malarial in Bangkok. In the dry season (half of the year) no rain falls and the grass turns yellow, the few orchids and other flowers must be watered twice a day, and the stagnant klongs slowly dry up, giving off a putrid and all-pervading odour. On the other hand, in the monsoon season so much rain falls that the land becomes completely flooded, and the grass, which cannot be cut fast enough, soon grows waist-high and those deadly serpents, the branded kraits, lurk around the house.

If the houses are not mosquito-screened (there are no glass windows, because it is too hot), then once the sun has set clouds of mosquitoes fly around the lights inside the house. More spectacular creatures are the praying mantis and large green cicada-like insects which buzz round your head with a noise like an aeroplane. More sinister perhaps is what we called the bombing beetle, about twice the size of a bee and with two yellow vertical stripes. With a little puff this beetle blows out from its tail

a tiny cloud of brown, acrid-smelling vapour which raises blisters on the skin. When stepped on, it makes a bang like a bursting paper bag and sends up a big cloud of the evil chemical.

Small lizards crawl up the walls and live by eating the mosquitoes. The big lizards, which are about a foot long and striped scarlet and emerald green, eat bigger insects; they are called "too-kay" because that is exactly the noise they make, and very loud it is too. We got into the habit of unconsciously counting the number of "too-kay" noises, because the Siamese believe that it is lucky if the lizard manages seven or more. The final "too-kay" always sounds like a sort of dying gasp.

In the city itself, and especially along the river banks, are a number of very famous Buddhist temples. They are highly coloured, large edifices containing various inner courtyards, gilded pagodas and huge, grotesque figures of gods. The numerous red-cloth-covered altars with their red-carpeted approaches have standing on them gilded figures of all sizes, offerings of food and burning joss-sticks. Red is the colour of good luck.

In the King's Temple, called the Temple of the Emerald Buddha, is a figure of Buddha in a glass case above the altar. At the beginning of each of the three seasons its clothes are changed. I remember once entering one of these temples (after leaving our shoes outside) accompanied by a Siamese Buddhist friend. He touched his head to the ground three times before the altar, and then we all walked on to the altar



... soon grows waist high

dais. There, after shaking hands with the priests, we sat down to crack jokes and smoke among the joss-sticks for half an hour, which seemed a rather surprising procedure.

Every house in Siam, including ours, had a little covered altar on a pole outside where gifts of food are made and joss-sticks burned. Sometimes one would see before the altars incredibly delicate and often quite large miniature houses and boats made out of coloured paper and thin strips of bamboo. Along with special paper "money" for the gods, these would be burned as a sacrifice.

Buddhism, of course, does not permit the taking of life. One result is that Bangkok has a population of ownerless, mangy curs called pi-dogs which appears to be double that of the human population. All day, and particularly during the night, packs of these pi-dogs hunt for food, snarling and fighting. A large proportion of them are supposed to be carriers of rabies. Their source of food has been diminished somewhat by improved, though still far from complete, collection of garbage, which formerly used simply to be put into the streets.

No mention of Bangkok would be complete without a reference to its famed night life to be found in the numerous

gaily lit cabarets and dance halls, night clubs, Chinese and Siamese restaurants, where such delicacies as stewed snake, caterpillar soup and Chinese "ancient eggs" are eaten with gusto. The Chinese more than the Siamese have a flair for delicious cooking, but perhaps it is as well not to know what is being served up.



... discomfort in beautiful things

Some of the most beautiful girls of a very beautiful race are to be found in the dance halls

employed as "taxi-dancers." One may dance with them—for a very short dance only—on presenting a rather expensive ticket bought at the cash desk.

Colourful and glamorous as this city appears, especially to the tourists, who are in the main American, it is rather surprising that nearly all the girls wear only a blue or black skirt and a white blouse—almost a sort of uniform—while the men wear chiefly tight blue or khaki trousers and a white or coloured open-necked shirt. The contrast is enormous when one sees these girls dressed up in the brilliant regalia worn for classical Siamese dancing—tight three-quarter-length trousers and jackets sewn with thousands of silver and coloured sequins, arms similarly covered, and tall tapering headpieces. Apparently they are trained from infants, as are our ballet dancers, and their slow, sinuous dancing suggests that they are jointless.






# Garden Notes

By Philip Harvey

Illustrated by John Sewell



**O**UTDOOR tomatoes will now be growing rapidly, and you should be picking your first fruits during August. Continue to rub out side shoots and pinch out the growing point directly three fruit trusses have formed. In my experience it is seldom possible to ripen four trusses outside, and the partially ripened fruits must be stored correctly if they are to finish off properly indoors or on greenhouse shelves. I am afraid amateurs often forget that tomatoes intended for storing must be picked when absolutely dry—the calyx especially should be free from the slightest trace of moisture.

In the north it is wiser to limit the trusses to two only, and even these must be considered a gamble.

Splitting of tomatoes often worries gardeners. This trouble is a functional disorder, no fungus being present. It usually begins with dry conditions at the roots. The skins of the tomatoes harden and heavy watering or excessive rain causes the fruits to crack. Splitting is perhaps more common with tomatoes grown against a south wall where the soil dries out fairly easily.

A south wall is, of course, an ideal site for outdoor tomatoes, but it is highly important to conserve moisture. A mulch of hop manure, peat, grass mowings or compost helps to keep the roots cool and reduces the likelihood of splitting. Incidentally, if you are using peat and it is at all dry, wet it

thoroughly before application. A mulch 2 in. deep is usually sufficient.

Tomatoes must not be planted near potatoes. The latter usually go down first with blight. This disease is very easy to recognise. Symptoms are black or dark brown blotches on foliage, stems and fruits. Damp, muggy conditions encourage the spread of the fungus. Hot, dry weather means that infection is less likely, and if you are in the dry eastern counties the plants will sometimes escape. Preventive spraying at fortnightly intervals with a copper fungicide is the recognised remedy, but it must be applied immediately the first signs of infection are noticed.

**I**f August is dry, lawns may become parched so that there is hardly any grass worth mowing. Should one sit back and wait for the rain to come, or is there anything that can be done to make the lawn presentable?

Let us deal first with mowing. Many gardeners mow without a grass-box, the idea being to let the cuttings return to the soil as a mulch. Experts still disagree about this, but my view is that in a drought, especially on light, dry soils, mowing without the box has no detrimental effects, even if it confers no clear-cut benefit.

On the other hand, mowing without the box in wet weather is definitely inadvisable. The grass clings together, causing a spongy

lawn. There is also some evidence that earthworms are encouraged. We all know that earthworms are excellent aerators of the soil in the garden proper, but as far as lawns go they have a real nuisance value, producing a muddy, slippery surface which is difficult to mow properly.

Frequent light mowings are much more effective than occasional severe cutting with the blades set low. If weeds are present, keep the grass-box on, owing to the risk of spreading the seeds over the grass. Do not mow in the same direction every time, as this may lead to thin patches of grass. It is a good plan to mow up and down one day, the next time at right angles.

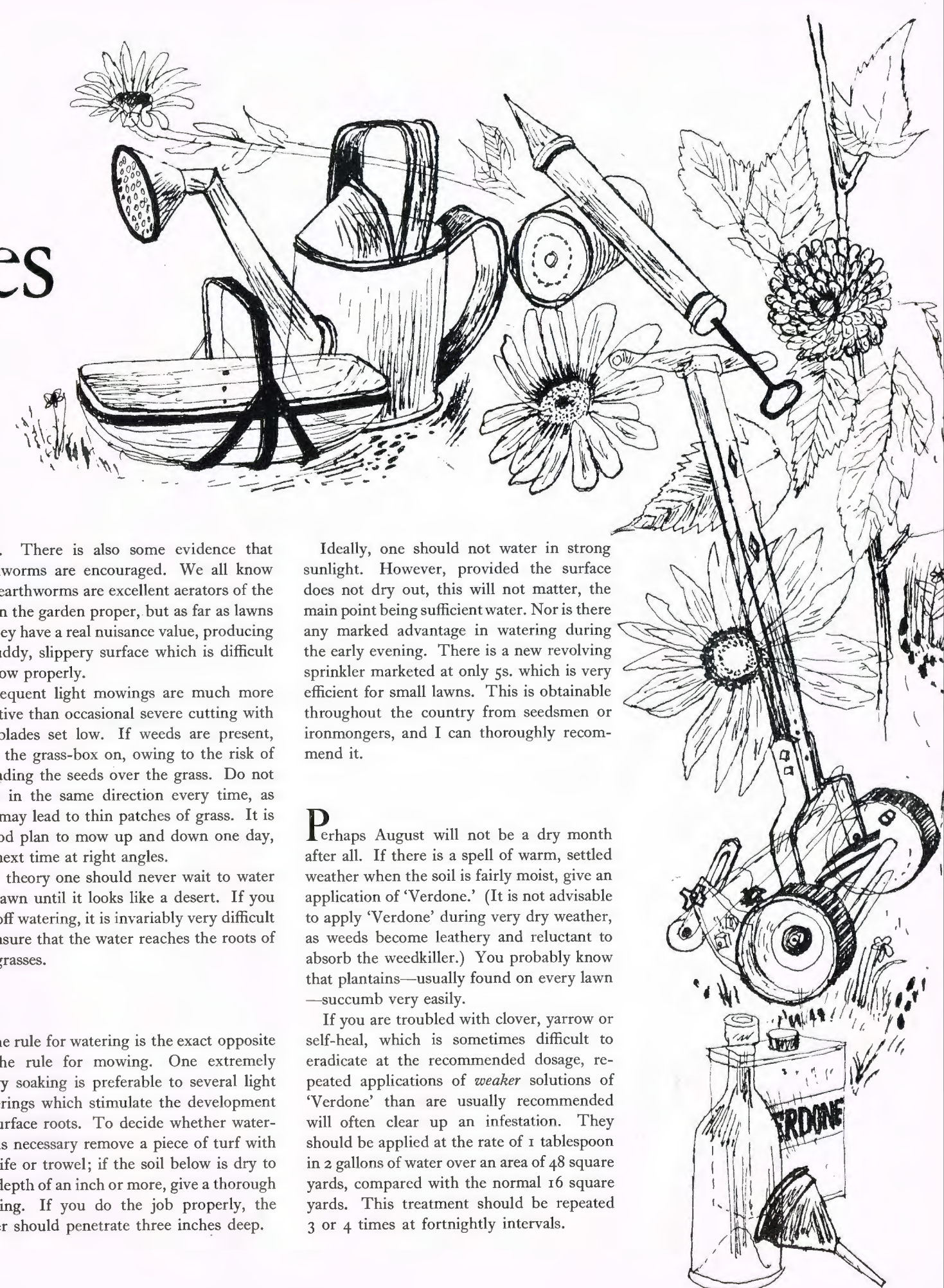
In theory one should never wait to water the lawn until it looks like a desert. If you put off watering, it is invariably very difficult to ensure that the water reaches the roots of the grasses.

**T**he rule for watering is the exact opposite to the rule for mowing. One extremely heavy soaking is preferable to several light waterings which stimulate the development of surface roots. To decide whether watering is necessary remove a piece of turf with a knife or trowel; if the soil below is dry to the depth of an inch or more, give a thorough soaking. If you do the job properly, the water should penetrate three inches deep.

Ideally, one should not water in strong sunlight. However, provided the surface does not dry out, this will not matter, the main point being sufficient water. Nor is there any marked advantage in watering during the early evening. There is a new revolving sprinkler marketed at only 5s. which is very efficient for small lawns. This is obtainable throughout the country from seedsmen or ironmongers, and I can thoroughly recommend it.

**P**erhaps August will not be a dry month after all. If there is a spell of warm, settled weather when the soil is fairly moist, give an application of 'Verdone.' (It is not advisable to apply 'Verdone' during very dry weather, as weeds become leathery and reluctant to absorb the weedkiller.) You probably know that plantains—usually found on every lawn—succumb very easily.

If you are troubled with clover, yarrow or self-heal, which is sometimes difficult to eradicate at the recommended dosage, repeated applications of *weaker* solutions of 'Verdone' than are usually recommended will often clear up an infestation. They should be applied at the rate of 1 tablespoon in 2 gallons of water over an area of 48 square yards, compared with the normal 16 square yards. This treatment should be repeated 3 or 4 times at fortnightly intervals.





# How to Grow Strawberries

By Ralph Hodgson (Wilton Works)

Few if any fruits can surpass the strawberry in flavour. Yet of all the fruits it is the one which responds best to the individual care and attention of the spare-time gardener. Here is some sound practical advice on how to grow good strawberries.

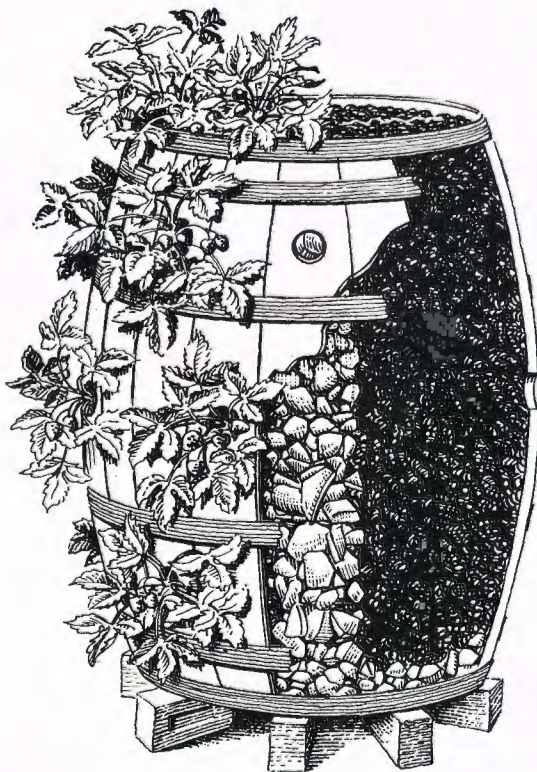
**W**HAT more tempting fare for a hot, dry day than a bowl of ripe, juicy strawberries fresh from the garden, accompanied by a jug of thick cream? We may not have the cow to produce the cream, but anyone with a plot or garden can produce the strawberries. Thus the satisfaction of having grown the fruit oneself adds to the enjoyment of the dish.

Easy to grow? Yes! Many hours of attention? No! Expensive to grow? No! Though thriving best on medium to light soil, they will succeed in almost any garden save those with an excess of lime. On chalky soils or land with a high lime content the plants are usually short-lived.

Sound drainage is very important, as surface water must never be allowed to remain in winter. The soil should be well dug, and bearing in mind the fact that the land will be undisturbed for at least three years, all weeds must be eradicated. As much manure as available should be incorporated. Farmyard manure or compost is the best; if none is available, a liberal dressing of bonemeal or any compound fertilizer may be used.

Strawberry flowers are highly susceptible to spring frosts, and one must therefore never plant on low-lying ground or in hollows.

There are two main types of frost—radiation and wind. The former may be expected on still nights, when the air



*Strawberries grown in a barrel*

close to the ground becomes progressively colder. Wind frosts are more common on hill-tops. Though frosts are rare in April and May, it is still inadvisable to grow your strawberries on a hill-top.

Some varieties are more susceptible to frost damage than others. Strawberries that blossom early, i.e. Perle de Prague and the well-known Royal Sovereign, can lose a considerable proportion of their crop from spring frosts, whereas the late-flowering Huxley may escape almost unscathed.

Another important point is to remember that wireworm can attack strawberries. If you are proposing to plant on land newly broken up from grass, which is quite likely to harbour this pest, work in some of the new gamma-BHC dust.

Phosphorus deficiency shows up very clearly on strawberries, producing acid, undersize fruits and purplish foliage. It is accordingly always worth while incorporating bonemeal or superphosphate when preparing the ground. Light soils are frequently deficient in potash, and sulphate of potash is the best form in which to apply this element. By far the most important stimulus to heavy cropping is, however, farmyard manure, muck, dung—call it what you will. Commercial growers apply as much as twenty tons per acre before planting.

Strawberries are very liable to a virus disease which



*A fine example of the Auchencruive Climax strawberry*



restricts the growth of leaves and fruit and rapidly spreads through a bed. For this reason the beginner would be well advised to obtain his initial plants from a reputable firm selling government certified virus-free stock.

Avoid like the plague the friend who offers a hundred-weight of plants from his old bed unless you are sure that he has obtained virus-free stock within the last two years. Plants cost approximately six to ten shillings a hundred. Bearing in mind that numerous runners can be taken the following season, the cost of the original hundred can be shared.

Many amateurs are discouraged by the idea of having to put all their plants to sleep in straw at the fruiting season. Some varieties, however, bearing their berries several inches from the ground, reduce the need for this strawing. The variety Auchencruive Climax has this quality and is indeed an excellent strawberry for the amateur. Bearing in mid-season, it also escapes late frosts at flowering time which reduce the crops of many earlier sorts.

The best time for planting to obtain a crop the following summer is August or early September. This planting can also be done in early spring, but it is then inadvisable to allow the plants to fruit the same season. Set the rows eighteen inches to two feet apart and twelve to fifteen inches between the plants, spreading the roots fanwise, planting firmly and making sure that the crown is just above the soil.

In a very dry season, watering may be necessary for August planting. Strawberries are woodland plants and form new flower-bearing crowns in the autumn. If available, therefore, an autumn top-dressing of strawy manure or compost is very beneficial. Do not delay if possible until spring. Another method is to set the rows wider apart and lightly dig between them in autumn to incorporate manure and control summer-grown weeds.

### *Netting Essential*

Plants require little attention other than hand weeding as necessary. Birds—feathered and human!—are very partial to ripe strawberries, so if possible the plants should be covered with netting as the fruit takes on that tempting strawberry hue. If a wire on light posts three to four feet high can be run down the centre of the bed and the net stretched tentwise and pegged down the sides and ends, the picker will be able to gather the fruit without total removal of the net.

A strawberry bed should be renewed every three years. A convenient method is to plant two new rows by the side of the plot each year and remove two old rows from the opposite side, though new beds can be planted in an

entirely different part of the garden if this is desirable. Runners for this planting should be obtained from the healthiest plants and in each case should be the first one from the parent plant, the remainder of the runners and all other surplus runners being removed. The point of the runner which you wish to keep should be pinched off—in other words, stopped—to enable the young plant to make a strong, vigorous growth.

There are two ways of propagating the plants. You can peg them down to the soil simply by bending a piece of wire and pressing the plant firmly to the soil. Or you can make a small hole in the ground, place a three inch pot filled with a prepared compost in the hole, and pin the plant firmly to it; this will naturally produce much better plants than those grown in ordinary soil and will be much easier to lift when the time comes to transplant them.

The following is a good compost for this purpose: Two parts of good soil or loam, one part of horticultural peat and one part of coarse sand. To this add  $1\frac{1}{2}$  oz. of superphosphate of lime and  $\frac{3}{4}$  oz. of ground chalk per bushel of the compost.

### *Roll out the Barrel*

For those with little or no garden an interesting experiment is to grow strawberries in a wooden barrel. You can buy a barrel from advertisements in gardening magazines. Holes two to three inches in diameter should be cut nine inches apart in the side, and one-inch holes drilled in the bottom for drainage. A layer of broken bricks or gravel should cover the bottom of the barrel to a depth of three to four inches.

The barrel should then be filled with as fertile a soil as possible. Humus is essential, as it helps to retain the moisture. Make the soil firm by ramming it lightly when the barrel is filled. In the centre of the barrel put gravel or, better still, a drainpipe with the top slightly above the soil level and one third from the bottom. This simplifies watering.

Plants are set in each of the holes, with the leaves outside and the roots firmly set in the soil. The top of the barrel is also set with plants. Do not allow any runners to form, and take care that the plants have plenty of moisture. Water regularly, mainly in the evening so that the plant gets its fill. (Watering in the morning is ineffective, as the sun dries out the moisture.) The gravel or pipe down the middle will assist the water to get to the bottom, but make sure the barrel does not become waterlogged.

Put the barrel in a sunny position and cover round with small-mesh wire netting to keep out intruders such as cats and sparrows. On the subject of harvesting the ripe juicy berries, no one needs any advice. When they are ready, just pick 'em, eat 'em and enjoy 'em!

# Colour Printing

By David Hopewell

(Works Manager, The Kynoch Press)

The beautiful colour printing of the *Magazine* done at The Kynoch Press has been admired in many quarters. Here is an account of this fascinating technique, from the taking of the photographs from which the blocks are made down to the final printing.

WITHOUT light there is no colour. Light consists of waves, the length of which determines visible colour; the wavelengths of blue and violet, for instance, are shorter than those of orange and red. The human eye is sensitive only to certain wavelengths, and these make up the range of colours we see and enjoy in our everyday life.

White light is a combination of all colours, and coloured light is white light with some components absent. By passing white light through a prism it is possible to split it into a band of brilliant overlapping colours (called the spectrum) which are its components. These colours which merge and blend so beautifully into one another are red, orange, yellow, green, blue, indigo and violet.

Colour in the form of light waves differs greatly from colour as a pigment, the primary light or spectral colours being orange, green and violet, while the primary pigmentary colours are crimson, yellow and peacock blue. Because of this, the superimposition of primary pigment colours gives a very different result to the superimposition of primary spectral colours.

Thus, if three beams of light—orange, green and violet

—are projected on to a white screen, the result will be white light. But the superimposition of the three primary pigment colours—crimson, yellow and peacock blue—will produce a near black.

Nevertheless, most of the colours in the spectrum can be obtained by mixing two or three of the primaries in varying proportions and the colours so obtained are called secondary and tertiary colours. This fact, coupled with the discovery of a certain Clerk-Maxwell in 1857 that by projecting coloured lights and using certain colour filters it is possible to produce a coloured picture, forms the basis of all colour photography and colour printing.

Unfortunately, it is not yet possible to obtain as printing ink primary colours which are permanently and theoretically correct. Many of the defects in colour printing arise from this cause. A lot of compensating work has therefore to be done by both the process operator and the printer. This work, being dependent on individual judgment, is not always accurate, but it is always painstaking and costly.

Photographs, both plain and coloured, are printed by using as a medium an engraved copper plate commonly called a block. For the preparation of this a screened



*First printing: Yellow plate*



*Second printing: Red on yellow*



*Third printing: Blue on red on yellow*



*Fourth printing: Black on blue on red on yellow*





photographic negative is necessary, and the work begins at the photo process camera.

A typical camera used at The Kynoch Press, which will take a photographic plate or film up to 20 in.  $\times$  20 in., has an apochromatic lens which can be stopped down to  $f_{90}$ , and moves on track rails 20 ft. long. The screened negative is obtained by introducing a ruled screen into the camera between the lens and the unexposed plate or film. The screen consists of two sheets of optical glass. Each is ruled diagonally with a number of lines, usually 133 to the inch, the width of the lines and the space between the lines being equal. The number of lines to the inch may vary from 90 to 200.

### *Breakdown into Dots*

These two sheets of glass are placed together, ruled face to ruled face, so that the lines cross at right angles. The effect of interposing this screen is to break up the photographic image into a multitude of small dots. Most readers will have observed this in newspaper illustrations, where for a variety of reasons a very coarse screen is used.

It is this technique of screening combined with colour filtering that forms the basis of all colour printing. The first stage is the making of a screened photographic plate, using colour filters. The subject to be reproduced is mounted in front of the camera and illuminated by a battery of very powerful arc lamps. The camera is loaded, the ruled screen is interposed with the mean of the lines at  $90^\circ$  to the perpendicular, a violet filter is introduced into the lens, and an exposure is made. The effect of the filter is to pass into the camera only those reflected light rays which represent the amount of yellow in the picture.

### *Four Different Exposures*

The camera is then loaded with a fresh photographic plate, the screen is set this time at an angle of  $105^\circ$ , and this time a green filter is inserted. When the exposure is made, this filter passes only those light rays reflected from the crimson content of the picture. Again the camera is loaded, the screen is set to an angle of  $75^\circ$  and an orange filter is inserted. On exposure only those light rays representing the amount of blue in the picture are photographed.

It was stated earlier that the primary pigments when superimposed would produce only a near black. In order to strengthen the detail of the picture and give the finer shadings of light and dark tones, a further black exposure is made with the screen set at an angle of  $45^\circ$  and no filter in the camera. Each of these four photographic plates now

carries an image representing a colour waveband from the spectrum.

From these photographic plates four copper plates must be prepared with the image etched in relief on its surface. To do this each copper plate is coated with an emulsion of fish glue and ammonium bichromate. The screened negative is then placed on top, and the coated copper plate is exposed through the negative to an arc lamp. The effect of light is to harden the bichromate, and the greater the light (varied, of course, in intensity by the photographic plate), the greater the hardening. The plate is next heated over a gas jet. This turns the bichromated fish glue into an acid resist whose efficacy varies in proportion to the degree of hardening by light.

### *Etching the Plates*

The copper plate is now ready to be etched electrolytically in an etching bath of ammonium chloride and sodium chloride. The four etched plates are then proved and the colour values corrected manually by a process engraver. This last is a job of immense skill, so much so that the making of top-quality colour blocks becomes through the work of the engraver as much a manual craft as a technical process.

After correction the set of colour plates is ready for printing. Normally the yellow plate is printed first. Next the red plate is printed in exact position or register with the yellow, and all the sheets previously printed with the yellow image are overprinted in red. This operation is repeated for the blue and black images. In each of these printings the speed of the printing machine must not vary.

### *A Perfect Match*

The ladies will appreciate something of the craftsmanship of the printer, who has first to match the colour exactly and then maintain that perfect match for thousands of copies. Also he has to control a very precise piece of machinery through which sheets of paper are travelling at a speed of some 300 ft. per minute. The maximum tolerance permissible in colour printing being half of one-thousandth of an inch (otherwise the picture becomes blurred in outline), it will be apparent that this branch of the industry calls for a high degree of skill.

The whole task is complicated by the fact that paper is extremely susceptible to changes in humidity, and a sheet fifty inches across can stretch a quarter of an inch for a small increase in humidity. If this happens between printings, the result can be disastrous.

Funnily enough, printers live to a ripe old age!

# ICI NEWS

## THE DUKE OF EDINBURGH MEETS I.C.I. APPRENTICES

THE Duke of Edinburgh, visiting the Production Exhibition organised in London last month by the Institute of Production Engineers with the support of the British Productivity Council, was conducted round the I.C.I. stand by Sir Ewart Smith, I.C.I. Technical Director. During his tour of the stand the Duke spoke for several minutes with two Wilton Works apprentices about their training.

The I.C.I. stand, with the theme "Productivity in Practice," summarised in pictures, diagrams and exhibits the Company's activities in the fields of work study, standardisation and training. The Education and Training section underlined the connection between productivity and training at all levels. A special exhibit showed the form of training given to apprentices, and after the Duke had heard from Mr. Norman Langdale, education officer at Wilton Works, about the general scheme of apprentice training he questioned Apprentice Electrical Fitter Clive Smith and Apprentice Mechanical Fitter Keith Williamson about the examples of apprentices' work on the stand. These ranged from simple straight-edges and calipers to a model of the vacuum salt plant at Stoke Prior Works and a working model of a steam engine—all made by apprentices at various stages in their first year with the Company.

The Work Study section comprised a detailed and fairly technical summary of what work study is, including displays

illustrating and explaining the techniques of method study and work measurement. Incentive schemes based on work study were also described. Many of the charts, diagrams, photographs and models on the stand were those actually used by the Company in training its employees.

The Standardisation section displayed a selection of I.C.I. standards documents and standardised items of equipment. A chart showed the organisation by which the few actual specialists on standardisation in I.C.I. are guided by others throughout the Company who are experts in their own fields. One of the exhibits was a replica of the first standard used by an I.C.I. company: a Brunner Mond horse and cart, standardised before the turn of the century.

In a B.B.C. broadcast on 13th July, Sir Ewart Smith, who is deputy chairman of the British Productivity Council, said that the exhibition had made industrial history. It had been intended primarily for industrial managers, trade union officials, Civil Servants and all those who had an influence, direct or indirect, upon industry and the climate in which it works. "But," said Sir Ewart, "its importance is far wider than this, for the adoption of the ideas shown in the exhibition can materially improve the economic position of the country relative to the changing world in which we live. Success or failure will depend on the extent to which each one of us understands and adopts this conception of dynamic progress."



The Duke of Edinburgh talks to Wilton apprentice Keith Williamson on the I.C.I. stand at the Production Exhibition. Behind them is Sir Ewart Smith, and on the right are Mr. Norman Langdale and apprentice Clive Smith.



## HEAD OFFICE

### Mr. D. H. B. Wride

Few I.C.I. people can have had a more varied and interesting career than Mr. D. H. B. Wride, who retired from the Company's service on 30th June. It started on 1st January 1920, when he joined Brunner, Mond & Co. at Winnington to work on the schemes that were afoot for the production of synthetic ammonia at the Billingham factory which had been taken over from the Ministry of Munitions. However, it was at Runcorn that Mr. Wride first qualified for an entry in the I.C.I. roll of fame by starting up the No. 1 ammonia plant at Castner-Kellner Works. The fact that this plant is still working after thirty-three years says much for the impetus he gave it.



Mr. D. H. B. Wride

The year 1923 saw Mr. Wride in charge of the first boiler plant at Billingham, then the ammonia sulphate plant, and later the synthetic ammonia plant which, appropriately enough, produced its first ammonia on Christmas Eve 1923.

During the following five years Mr. Wride displayed unusual versatility in controlling seven new plants at Billingham, and in December 1928 he was made works manager of the newly formed Cement Division (Casebourne & Co. Ltd.).

Moving from cement to 'Drikold,' Mr. Wride, three years later, became a director of Refrigeration Patents Ltd., and subsequently combined this work with similar duties with Sulphur Patents Ltd., formed for the exploitation of the Billingham sulphur recovery process. All this work was done under the chairmanship of Mr. (now Sir Wallace) Akers.

Mr. Wride went to London in 1939 as personal assistant to Mr. Lutyens in connection with the development of the new nylon project. After a short sojourn at Welwyn Garden City on the outbreak of war, he was seconded as director and general manager of the newly formed British Nylon Spinners Ltd. Fortunately he and B.N.S. survived the Coventry blitz, and nylon yarn was first spun in January 1941.

At the end of 1946 Mr. Wride returned to I.C.I. but spent two years in Germany as Board of Trade representative on T Force, which was engaged in examining scientific documents and interrogating German scientists. This work well qualified him for his latest task with Central Purchasing Department, which was to reopen the Company's relations with the German chemical industry.

## ALKALI DIVISION

### Works Council's Silver Jubilee

The 300th meeting of Winnington Works Council took place on 15th June. In the canteen afterwards there was a 25th birthday tea-party at which honour was done to six pensioner survivors of the first meeting: Messrs. Joe Buckley, Alf Dale, Harry Gittins, Charlie Hickson, Arthur Horton and Tom Lewis. Mr. Lewis, at 85, was declared Father of the House *nem. con.* Another honoured guest was Mr. Bill Hubball, chairman of the payroll representatives until his promotion to the staff last year.

In welcoming them all, the chairman—Mr. J. D. Maughan (Winnington Works manager)—paid tribute to the high standards they had set, and expressed the hope that their successors would be found worthy of their example. It was fitting that in his reply Mr. Hubball was able to welcome the introduction of the profit-sharing scheme that he himself had done so much to bring into being.

Members and guests of the Council were joined during the social evening that followed by their former chairman, Mr. E. Henderson (production director), and secretary, Mr. J. H. Fell (Division labour manager).

### Children's Summer Camp

Thanks to the staff and payroll workers of the Alkali Division who contribute to the Children of the Unemployed (Assistance) Fund, a party of 169 Northwich children enjoyed a week's holiday in Dyserth, North Wales, in June. The camp in which they stayed belongs to the Merseyside Holiday Camps for Children, a non-profit-making body, which also owned the camp at Ruthin where the children stayed last year.

Even the damp weather that prevailed for most of the week could not lessen the high spirits of the children, and when the



Swinging high at the North Wales camp for Northwich children

rain *did* force them to stay indoors a well-organised programme of games, concerts and film shows was quickly put into operation. A great favourite with the children was the film of last year's camp made by the Alkali Division Information Service. The indoor swimming pool was popular.

Generally speaking, however, the holiday proved to be an outdoor one. The children explored the surrounding countryside and had great fun climbing the hills behind the camp and admiring the Dyserth Falls, a well-known beauty spot. Frequent visits were made to the sea and sands, the camp being conveniently situated on a bus route four miles from Rhyl and two miles from Prestatyn. A coach tour took campers one day through the heart of the Snowdonia district, with a call at Caernarvon Castle.

The children were looked after by twenty Alkali Division volunteers, including works councillors and lady helpers. Miss M. G. Haward (Division women's welfare supervisor) and Mr. T. Holland (Division youth supervisor) were in charge of the whole party.

## BILLINGHAM DIVISION

### Crane Driver's 20-year-old Camera

While on holiday in the south recently Mr. William Dean, a crane driver at Trimpell Ltd., Heysham, photographed the tower of Windsor Castle. When he saw the colour photograph of the castle on the cover of the June *Magazine* he sent in his own black-and-white picture "to show what an old, but cherished, camera can produce."



Windsor Castle. A picture taken with a twenty-year-old camera.

Mr. Dean took his photograph with a John Bull Ensign box camera which he acquired twenty years ago by sending in 72 consecutive tokens to the *Daily Herald*. "It is so good," says Mr. Dean, "that I would not exchange it for a modern one."

## DYESTUFFS DIVISION

### New Accident Indicator

Huddersfield and Blackley Works have had the distinction of being awarded a special target by Sir Ewart Smith, I.C.I. Technical Director, in view of the many periods they have worked of more than a million man-hours without a lost-time accident. This new target is a period of two million man-hours, which, if attained, will be something of an achievement.

The Accident and Safety Propaganda sub-committee at Huddersfield, in an endeavour to create maximum enthusiasm and to keep all people in the factory posted of the position to date, have decided on a somewhat unusual accident indicator.



Huddersfield Works' new accident indicator

They make no apology for using the Everest theme, as the climb to two million hours will be as steep as the famous mountain. "Camps" are placed as each level is reached, a coloured indicator board, the same shade as that of the small wooden "tent," is affixed in the "hours reached" column, and a small wooden figure of a climber is also moved gradually. When a lost time accident occurs all coloured boards and "camps" are removed and the climb starts again from the bottom.

This unusual method of accident indication has caused widespread interest, and it is hoped that the board will not become part of the scenery as quickly as the more orthodox type of indicator.

### Queen's Gambit by Wire

One evening in June chess teams from Blackley and the Kynoch Works of Metals Division "met" for a six-board match that was unique in I.C.I. The players never met in fact, for they exchanged moves over the I.C.I. private telephone wire between Birmingham and Manchester.

One "second" was allocated for each two players; the player himself wrote down each move on his score-sheet, stopping the clock which was timing him as soon as he had moved. The second took the score-sheet to the telephone operator, who passed the message to the operator at the other end. There the move was recorded on the appropriate score-sheet and



Chess by telephone. A picture showing the Blackley end of an unique inter-Division match.

handed to the appropriate second, who made the move on the board and restarted the player's clock. Players were allowed thirty moves an hour, and a supervisor at each end ensured that the rules of match-play chess were strictly observed.

The result of the match—Blackley 3½, Kynoch 2½—reflected the even strength of the two teams. The battle of the giants on board 1 took place between Burbridge (Kynoch), with the black pieces playing a French defence against Ansell (Blackley), who tried the fairly recent innovation of 6P-QR3. Although Black played a fairly solid defensive line, he made a definite slip on move 13 which allowed White to pin Black's queen's knight and win a piece by force six moves later. By move 29 Ansell was a piece and a passed pawn ahead, and his opponent resigned.

On board 2 Batty (Blackley) with black played a Sicilian



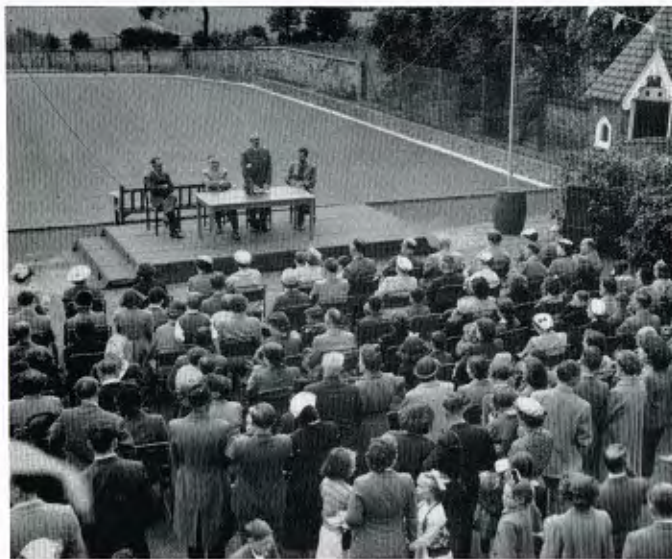
defence against Mills (Kynoch); White clearly got into time trouble about the seventeenth move and just failed to find the strongest line, allowing the advantage which he had maintained up to that point to slip away. When the time came for adjudication at 9.40 p.m., White resigned.

On board 3 Markendale of Blackley met Needham of Kynoch. Waters of Blackley played Temple of Kynoch on board 4, McCaw of Blackley played Cronshaw of Kynoch on board 5, and Bodson of Kynoch met Worthington of Blackley on board 6.

But to players and organisers the result was less important than the fact that the match took place so successfully. They hope the matter will not end there and that telephone chess matches will be arranged with other I.C.I. teams.

### Recreation Club Opens

Trafford Park Works' new Recreation Club, The Hawthorns, was officially opened on 19th June by Mr. C. Paine, Dyestuffs Division chairman. The works manager, Mr. J. C. A. Chivers, presided at the ceremony, which was attended by representatives from other works and Division headquarters and by a full turn-out of the works council and the club executive council. Among the many other people attending were five retired pensioners with a combined age total of 380 years, all looking fit and well. (In fact one of them, Mr. E. Alsop, was only prevented from winning the bowling tournament by one shot in the final.)



Mr. Paine opens Trafford Park Works' new recreation club

The club, which stands in an acre of ground, was formerly the private residence of the late Sir Thomas Robinson, K.B.E., J.P. The interior of the house has been completely transformed. On the ground floor there are now a bar, lounge, and billiards and games room; upstairs are a social room for concerts and other functions, a room for photographic work, and the steward's quarters. A bowling green has been laid in the grounds and there are two tennis courts (which can be used for netball in the winter) and a cricket practice pitch.

Opening day was also a gala day, and the sun shone down on flags and bunting. Games, races and sideshows were arranged for the children on the adjoining Ingleby playing

fields, and tournaments and competitions were provided for members and visitors with a concert in the evening to round off the day's pleasure.

A tremendous amount of spadework, planning and organisation has been put into this new venture, and Mr. Paine, who also opened the bowling green by throwing the first jack, complimented those responsible for transforming the clubhouse and grounds to their present state and added his best wishes for its prosperity in the future.

## GENERAL CHEMICALS DIVISION

### From Office Boy to Labour Officer

Mr. Joe Heyes, who retired at the end of May, had spent the whole of his working life at Pilkington-Sullivan Works. He went there as an office boy in 1908 and left as the works labour officer.

He was secretary to the works manager for twenty years, with the exception of two short breaks, during one of which he was serving in the 1914-18 war. Soon after the formation of I.C.I. Mr. Heyes became Pilkington-Sullivan Works' first labour officer.

In dealing with the many problems connected with the labour organisation Mr. Heyes earned the respect of his colleagues for his sound judgment. He was also associated with the I.C.I. Widnes and District Hospital Fund from its inception in 1930, as a member of the committee of management and as secretary from 1941. His experience in welfare matters stood him in good stead as a management representative on many local tribunals and committees.

## LIME DIVISION

### Distinguished Visitors to Tunstead and Hindlow

While in Buxton to attend a session of the National Association of Colliery Managers' conference, the Parliamentary Secretary to the Ministry of Fuel and Power, the Hon.



The Parliamentary Secretary to the Ministry of Fuel and Power (fourth from left) at Tunstead Quarry. On his left is Mr. F. C. Covill, Division production director.

Lancelot W. Joynson-Hicks, M.P., took the opportunity of paying a visit to Tunstead and Hindlow quarries. Accompanying him were his private secretary, Mr. G. G. Campbell, Sir Harold Roberts, the Chief Inspector of Mines, Ministry of Fuel and Power, and Mr. W. B. Brown, the Divisional Inspector.

## New Works General Manager

Mr. R. G. Jackson has been appointed works general manager with effect from 1st June.

Mr. Jackson joined the Billingham Division in 1934, where for two years he was a plant engineer on the old sulphate group. In 1936 he was transferred to the Lime Division. From then until the outbreak of war he was responsible for the erection of No. 1 Unit crushing plant, and later took over the maintenance of all the plant in the Tunstead valley. Subsequently he was concerned with the construction of No. 2 Unit crushing plant and the installation of all the quarry equipment involved in the Tunstead mechanisation scheme. For the last three years he has been responsible to the production director for all maintenance operations in the Division.

He was educated at Mexborough (South Yorks) Grammar School and Sheffield University, where he obtained a first-class honours degree in mining engineering.

His keen interest in sport is well known to his colleagues. In his younger days he was a first-class rugby football and cricket player and has represented his native county (Yorkshire) at lawn tennis.

He is vice-president of Hindlow Recreation Club.

## METALS DIVISION

### Award for "Terrier"

Metals Division employees and "week-end soldiers" alike will be interested to hear of the honour bestowed on Mr. H. Stockham (Light Metal Sundries Dept., Witton) by the Queen in her Birthday Honours List. Mr. Stockham, who has been with the Company for nearly nineteen years and now has two sons working at Witton, was awarded the B.E.M. in recognition of his service in the Territorial Army.



Mr. H. Stockham

Mr. Stockham joined as a bandsman at the age of 14 and has served with the 5th South Staffs Battalion, Walsall, for forty years—following in the footsteps of his father, who could also claim 40 years' service with the battalion. Now the oldest serving member of his unit, Mr. Stockham is the proud possessor of the Coronation Medal and two long service medals with three bars.

Mr. Stockham served in both world wars; during the last war he was a military police sergeant, and landed in France on D + 1. He followed the campaign through Europe and was demobbed in 1946.

### Cup for Youth Club Member

Every year, at the end of the football season, the Birmingham Youth Committee nominate one young player—he may be a member of any local youth club—whom they regard as outstanding for consistent good play and good conduct. This year the honour fell on a member of the Kynoch Youth Club, John Turner, who was acting captain of the Kynoch intermediate team last season.

This is the fourth time since 1938 that the Kynoch Youth

Club has won the cup, the previous recipients being Jack Prescott, Ken Steward and Geoff Stokes. John Turner and another Kynoch player, Douglas Beresford (son of the well-known professional Joe Beresford), have both played in representative matches for the Birmingham Youth Committee and are on the books of Aston Villa Football Club as amateurs.

## Capped for Wales

Bowls enthusiasts at Landore Works received a tremendous boost to their morale in June when one of their number, Mr. S. J. Perman, was selected to play for Wales against Scotland in a forthcoming series.



Mr. Perman, who has been selected to play bowls for Wales against Scotland

Mr. Perman, who has 14 years' service with the Company, is the first Landore bowler to reach international standard, and if the good wishes of his colleagues count for anything his contribution to the Welsh team's efforts should be noteworthy.

## NOBEL DIVISION

### Journey into the Jungle

Recently Mr. Gall Smith and Mr. S. E. M. Wright of Division Engineering Department flew to India to survey the site for the explosives factory which is to be built jointly by I.C.I. and the Government of India.

The site of the new factory is at Gumia in Behar Province, 200 miles north-west of Calcutta. Mr. Gall Smith and Mr. Wright visited it in the company of Indian Government surveyors, and were led through 6½ miles of heavy jungle by an Indian villager. He used the sun as his only reference point, and at each change of direction led off at a pace they found it hard to match. "He had only verbal instructions and a rough tracing," says Mr. Gall Smith, "yet he brought us to within 100 ft. of our landfall. Using maps and compasses in such terrain we should have failed to do this journey in as good time."





Mr. Wright and Mr. Gall Smith in the Indian jungle

Already the jungle nearby has been tamed. Three miles away the largest thermal power station in India has been built during the last three years, and in the same space of time a dam on the Konar river has been nearly completed. It will impound water to a depth of 160 ft. in a lake stretching 22 miles up-river.

The two Western engineers found much to interest them in the age-old Indian construction methods: men virtually clinging by the toes to bamboo scaffolding and working with both hands free, drills operated by bowstrings and two men working one jack-plane. "But," says Mr. Gall Smith, "the work was done and the result was good."

### In Search of an Ancestor

During his visit to Scotland and the Royal Burgh of Dumfries in early June the Brazilian Ambassador to the Court of St. James, His Excellency Senhor Samuel D. S. L. Gracie, visited the 'Ardil' fibre factory and saw over the research laboratories. His Excellency was accompanied on his visit by Mr. J. Henderson-Stewart, Joint Parliamentary Under-Secretary of State for Scotland.



The Brazilian Ambassador (centre) with Dr. A. G. White (left) and Mr. Henderson-Stewart

This tour in Scotland began at Dumfries for a particular reason. In 1806 His Excellency's great grandfather emigrated from the neighbourhood of Thornhill, and Senhor Gracie, on his first visit to Scotland, was anxious to find out about his ancestor.

### Fighting Back

Mr. Hamilton McNally is back in golfing form. For some years Ardeer's happy golfer has not played in annual competitions. With health restored his name is in the headlines as of old. Perhaps his most spectacular play for many years was on Saturday, 12th June. Over Killermont course in the Tennant Cup competition he returned a 36 hole score of 137. This was two strokes better than the previous record and one stroke better than Mr. J. C. Wilson's return earlier in the day. Mr. Wilson had looked like winning the coveted cup.

The Tennant Cup is one of the oldest one-day golfing tournaments in Scotland, and winning it is a considerable distinction. The winning was in the old "Hammy" style. On the way home his chance did not seem particularly bright; but the fighting spirit was up, and on the 13th and 14th greens of the last round he holed putts of four feet to be down in three. This was only the start of golfing brilliance. The inward half (4, 3, 4, 3, 3, 4, 3, 3, 3 = 30) brought him the cup and the admiration of all the golfing fans in Scotland.

"Hammy" has won most of the big golfing awards in Scotland, but although he had tried many times he had not been a Tennant Trophy winner. Now he adds that notable success to a big list.

### Shooting Success

Six members of the Ardeer Rifle Section travelled to Aberdeen and took part in the Scottish national shoot between 31st May and 5th June. By far the best performance was given by Mr. J. S. Young, who through the meeting showed his eye to be sure and his hands firm. Competing in Class A, Mr. Young had a remarkably consistent performance in the Scottish Earl Haig championship. In the qualifying round he returned four cards which among them dropped only 1 point. These cards were fired over the Dewar course, which means a double card over 50 yards and a double card over 100 yards.

Unfortunately the qualifying round totals do not count in the championship shoot proper. Here he did not do quite so well but scored 595 out of 600, three cards at 50 yards and three at 100. His 595 was two points short of the score which won the Scottish Earl Haig award. Mr. Young was a very worthy runner-up. Over all the cards, including qualifying round and final, he had the highest aggregate 994 out of 1000. He was chosen to shoot in the Scottish international side in the match against England.

Others who took part at the Scottish meeting were Dr. N. Chamberlain and Messrs. W. Young, R. Fleming, F. McDonald and F. Glen.

### PAINTS DIVISION

#### Making "Half-Safe" Safer

A strange vehicle appeared recently in the Birmingham garden of Mr. N. E. Cooper, head of the Division's metal pretreatment section. It was an amphibious jeep named "Half-Safe," in which Major and Mrs. Ben Carlin crossed the Atlantic in 1950.

That was only the beginning of their intended journey round the world, but after the Atlantic crossing the jeep needed a thorough overhaul. This involved the complete stripping and painting of the hull, and I.C.I. anti-corrosive undercoat and 'Kemobel' bright yellow anti-corrosive finish were used.



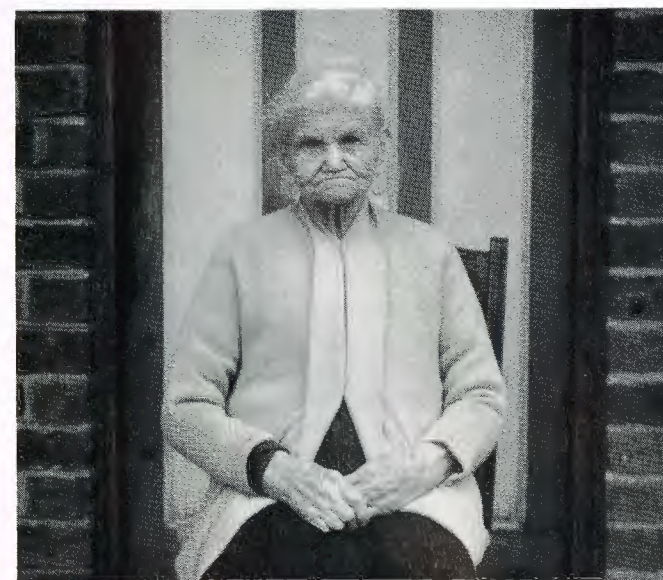
Major and Mrs. Carlin with their amphibious jeep, "Half-Safe," in Mr. Cooper's garden

The painting has now been completed, and "Half-Safe" will shortly be setting out again on its journey from Europe to India, then to Australia, and finally back to America via the Pacific Ocean.

### SALT DIVISION

#### Winsford's Centenarian

A telegram from the Queen, offering "warm congratulations and good wishes," was one of the messages of good will that poured in from all sides when Mrs. Alice Ashley, affectionately known as Grannie Ashley, reached her 100th birthday on 22nd June. Mrs. Ashley's association with the salt industry is surprisingly recent in view of her age. She took a job as a bag stitcher with the Salt Union when she was 60 years of age and stayed until she was 77.



100 years old in June. Mrs. Alice Ashley of Winsford.

Mrs. Ashley lives at 8 Bradford Mill Cottages, Meadow Bank, and still regularly does her share of housework there. In fact, Grannie just cannot get out of the habit of working. She was only seven years old when she took her first job as an errand girl for 1s. 6d. per week—few youngsters went to school in those days. A few years later she went into domestic service. After marriage, although she did not go out to work, she often took in washing to supplement the family income. She can still sew neatly without the aid of spectacles and she has never worn false teeth, but she admits to using a walking stick to help her get about nowadays.

More than a hundred people attended the centenary party in Grannie Ashley's honour at Meadow Bank Social Club on 26th June. The Ashley family was there in force—3 children, 16 grandchildren, 33 great-grandchildren and 1 great-great-grandchild.

### I.C.I. OF CANADA LTD.

#### Millhaven 'Terylene' Plant



The picture above shows some of the staff engaged on the construction of Imperial Chemical Industries of Canada's new 'Terylene' plant at Millhaven, Ontario. They are Mr. K. H. Barnard, Miss I. McMaster, Mr. L. W. Norfolk (supervising engineer), Mr. E. A. Donovan, Mrs. D. Amey, Mr. J. J. Isaac.

There are 1200 construction workers on the site, and the pilot plant has already been completed. Its output will be 1,000,000 lb. a year. Dr. Richard Beeching, who is in charge of the project, said recently that the main plant may well be finished before the scheduled date of mid-1955.

### I.C.I. (INDIA) LTD.

#### New Head Offices Opened

The new Head Office building of I.C.I. (India) in Calcutta was officially opened on 31st March by Dr. Mookerjee, Governor of West Bengal. Mr. R. C. Todhunter, Overseas Director of I.C.I., was in Calcutta for the occasion, and with Mr. N. D. Harris (chairman of I.C.I. (India)) received the numerous guests.

The new building, which is also the head office of I.C.I. (India)'s two manufacturing subsidiaries—the Alkali and Chemical Corporation of India and Indian Explosives—is



hailed by the *Calcutta Statesman* as an outstanding mark of I.C.I.'s confidence in the future of India and of their intention to play a full part in it.

I.C.I. House, as it is called, stands at 34 Chowringhee, adjacent to the Bengal Club. Chowringhee is to Calcutta as Piccadilly is to London, the Champs-Élysées to Paris or Fifth Avenue to New York, and one of the problems facing the architects, Messrs. Ballardie Thompson and Matthews, was to design the new building in keeping with its older neighbours. Hence the motif of the design was based on classical principles, modified in accordance with present-day architectural trends.

The building was designed, however, with an eye to business utility; there are no unnecessary decorative elements or superfluities. Even the columns that form part of the façade of the building are not wholly decorative, as might appear at first glance. Not only do they provide protection from the sun, but they give the building marked vertical lines which create an illusion of increasing height. The maximum height of the



*Mr. Shimizu, who has completed 50 years' service with I.C.I. (Japan)*

Mr. Shimizu started his service with the American Trading Company, who before 1918 were the agents of Brunner, Mond & Co. Ltd., and joined the staff of Brunner Mond when they opened their first office in Japan in 1918. He was appointed a director in 1941. In 1951 I.C.I. was delighted to receive him at Head Office and at a number of Divisions as a guest in this country.

There is a legend in I.C.I. (Japan) that until 1923 Mr. Shimizu had never taken a day's holiday until he decided to do so on 1st September 1923. In consequence he was away from the Yokohama office at the time of the disastrous earthquake which destroyed most of Tokyo and Yokohama and in which the whole of the staff in the Yokohama office were killed.

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### OUR NEXT ISSUE

Our lead in September is a write-up of polythene. Hitherto there has been a stern security ban on this process, invented just before the war by the scientists in Alkali Division and now made under licence practically the world over, bringing in enormous sums in royalties to I.C.I. A large-scale polythene plant has recently begun operation at Wilton, and a description of the plant will be written by F. M. S. Harmar-Brown.

Our colour feature is on the new Plastics Division laboratories at Welwyn in Hertfordshire. These have broken entirely new ground in laboratory design and are constructed on the principle of flexibility, i.e. the planning is so arranged that the size of the rooms can be altered at will by shifting the 'Holoplast' panels and the services tapped to provide laboratory benches wherever required. Moreover the building has a distinctive beauty all its own, in keeping with the best modern principles of design.

This is followed by an article describing that very ancient game which still flourishes in Scotland—quoits. We end with a short story written by Miss E. R. Jacobus of the Birmingham Area Office.

# Auntie's Bedroom—and All That

by A. S. Irvine (Alkali Division)

**Shove-Ha'penny and Devil-Among-the-Tailors, Darts and Threes-and-fives—these pub games are the essence of old England. Here a true lover of tradition brings back memories of ale and skill.**

IF all Gaul, as Caesar avers, could be divided into three parts, all England can certainly be divided into two. For when the natives congregate together to take their evening mug of beer, one part plays darts and the other shove-ha'penny.

I have never entered very deeply into the matter, but from what observations I have been able to make as I wander up and down the country, the boundary between the two—and between crown green and rink bowls for that—seems to follow the Avon, north of which darts is the predominant game and south shove-ha'penny.

Although a northerner by birth, I have a nostalgic affection for the southern game, as it is the only game of skill—beyond the delegation of responsibility—at which I have ever achieved a moderate success.

For me the gleaming straight-grained board, polished to a high gloss with nothing but elbow-grease and newspaper (beer makes it sticky), has an endless attraction. The five coins, ground flat on one face (in defiance of the laws of the land), all with their individual characteristics of weight and spin; the nine beds stretching up to auntie's bedroom and no semicircular dosser to spoil half the skill of the game; the chalk-marks growing on the scoring beds; the serious faces, stooping round a delicate titch; the dead spot in the gully that makes the front room easy if you know where it be: all these are indissolubly stamped on my memory. Ah, and the joy of drawing the upstairs bedrooms (including auntie's) on a fast, true board when your hand is in! And the double joy of the *Gold Albert*—all five coins in five beds with no titching up to mar the perfect play!

Not but what titching is the art of the end-game, of course. But *shove-ha'penny*—what a misnomer! *Caressing* the coin is what is needed. A shove on any decent board, and over the back the coin goes, down into the sawdust, and with it the goodwill of your fellow players and your reputation as a decent, sober-minded young man.

\* \* \*

It is many years since I have played darts on the old-fashioned Manchester board—a little fellow no bigger than a clock-face, with no treble ring and V-shaped doubles, now ousted by the new-fangled 301 double in, double out. No mathematics needed, either, as you played round the clock with a seven-foot pitch, first double and centre. And as the first double was never greater than ten (or else you had to walk), higher mathematics was not required. And the only variant in the monotony was to put a pile of pennies on the top of the board and try to knock them off.

That the invasion of the big London board with its treble ring and nine-foot pitch completely ousted the old game is perhaps a shame. But one thing it has done is to introduce a whole craft of lightning mental arithmetic, adding up first to make any number from 1 to 180, and immediately subtracting the result from anything up to 301. Naturally, everyone hopes to have double sixteen to finish his leg: in practice most games reduce to a frenzied battling for double one, for 32 repeatedly split will bring you to it from the bachelor's side of the board by four natural dimidiations. But there are those that will purposely adjust their score to leave them 32—and they will



*I.C.I. (India)'s new headquarters at 34 Chowringhee, Calcutta*

building was stipulated when the Bengal Club, which owned the site, sold it to I.C.I.

I.C.I. House is of steel and concrete throughout. Wide use has been made of 'Holoplast,' 'Perspex,' 'Vynide' and 'Dulux' for the interior, and the entire building is air-conditioned. The amenities include luncheon rooms, a cinema, bedrooms for business visitors and a ground-floor garage.

The provision of a new headquarters for I.C.I. (India) had become an urgent necessity with the great expansion of its trading activities and its increasing participation in manufacture. The Company's turnover has increased since 1949 from £4 million to a present level of £16-17 million per annum.

### I.C.I. (JAPAN) LTD.

#### *Yokohama Survivor completes 50 Years' Service*

Mr. M. Shimizu, a director of I.C.I. (Japan), recently completed 50 years' service with the Company and its predecessors in Japan, and on 15th May a garden party was held in his honour in Tokyo at which he was presented with a silver salver bearing the signatures of Mr. R. C. Todhunter and Mr. Shimizu's fellow directors of I.C.I. (Japan).



often get their double 16 without splitting it and trailing off to double one.

Now this has given rise to a whole series of magic numbers that are carried in the heads of our experts. To the layman, what significance is there about numbers like 89, 53, 67 or 92? To the experienced thrower these are quick ways home:  $89 = 3 \times 19 + 2 \times 16$ ;  $67 = 3 \times 9 + 2 \times 20$ —treble nine, double top, and out you go to win your leg.

\* \* \*

Another pub game at which I once enjoyed some skill is *Devil-Among-the-Tailors*. This is occasionally seen north of the Avon, and in my youth I used to make a pilgrimage of a few miles to play it in Cheshire, until death robbed the one-armed landlord of his pub, and the pub of his board.

In this game nine small barrel-shaped pins are stood upon a square base set diagonally in the middle of a baize-lined tray, there to be knocked down by a round cheese on the end of a string that is swung outside the supporting post and allowed to swing back on to (one hoped) the king pin. Although the gap between the pins is only a shade wider than the diameter of the cheese, it is surprising how easy it is to flight the cheese through the pins without touching them—when you don't mean to, of course. If, on the other hand, the king pin be struck just right, all nine may be knocked down, and a set-up allowed so that, in your three swings, 27 is a possible.

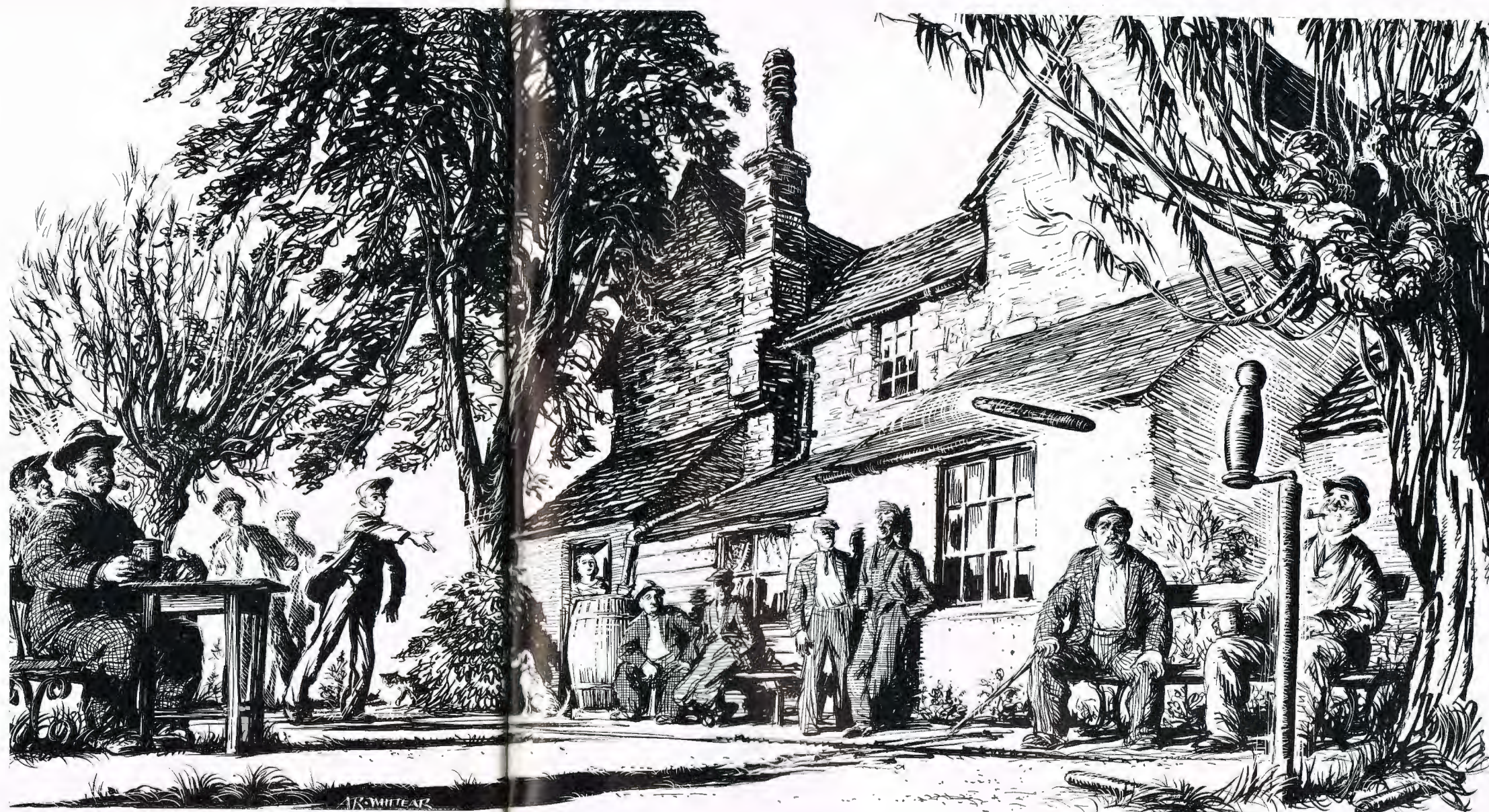
But for all your set-ups it is the end-game that counts, as the object is to score exactly 101. Thus if you have scored 98—you do not have to be very good to average sevens—you are left with the problem of knocking down three pins *and no more*. So for the first time in the evening you knock down all nine.

The configurations of pins left at the end of the first swing have many local names, from the obvious (such as London Bridge and Aeroplane) to the quite obscure; names that are often used, too, in *Devil-Among-the-Tailors'* big brother—alley bowls. This, though, is hardly a pub game: I myself have only trundled a cheese at man-sized pins in clubs, though I have been told (by no less a person than a police inspector) that some pubs, particularly in the cider country, have bowling alleys attached, so that frequent stooping can crack the chalk out of the joints in the regulars' spines.

\* \* \*

Rather more serious is the group at their chips in the corner of the bar parlour there. If they be playing *penny-knock*, you will be told that it's a soft beggar that canna win his own drop—and find that it's a clever one that can.

In Cheshire, where men are men, no nambly little south-country pack is used but a fine pack ranging from double-



... in a little pub a bare hour's stroll from the dreaming spires of a famous university

fat and double doll's-eye right up to plum cake—a fine rich domino resplendent with eighteen spots. And the Cheshire man, as broad of hand as he is of heart, thinks nothing of you if you cannot engulf a dozen chips, six in each hand, picking them up off the table in one swift movement that takes years to perfect.

Though penny-knock—a game that we learn in our nursery—is suitable for a quiet, contemplative evening when the bitter is in good nick, you may find yourself provided with a cribbage board, wedged in the corner of a high oak settle, and forced to play *Threes-and-Fives*. For here mathematics is required; not perhaps the high flights of darts, but an instant and uncanny knowledge of the multiples of three and five, for you score by trying to make the two ends of the snake add up to a multiple of three or five. And if your chip, carelessly played, allows

your opponents to follow on and make the ends add up to fifteen, then your fate is sealed.

With ill-concealed joy they peg up eight—five for the five threes, and three for the three fives—while your partner wonders—often openly—just what stopped them drowning you at birth.

\* \* \*

Finally, the most pleasant and contemplative games are played in *gardens*—and I do not count even a crown green as a garden. There is a handful of these that are played behind pubs; but one I treasure, for I believe it to be unique.

In a little pub a bare hour's stroll from the dreaming spires of a famous university town there is a pleasant glade behind the house. Here, on a pipe stuck in the earth and

standing some thirty inches proud, is a twelve-inch wooden skittle, stood on an iron ring radiused out a short way from the pipe. At this you pitch with staves that might once have been chair-legs. A mere glancing blow will only make the dolly spin round and round at the top of the pipe, for it takes a jolly good direct hit to knock her off. And the gentle exercise—pacing down to pick up the staves, with the delicate stooping involved—has a wonderful mellowing action upon jangled nerves.

There I have many times found peace: the bells sound distantly from the spires down in the valley; the cooing wood-micks blend with the soft burr of country voices; tobacco smoke curls lazily on the evening air. The gentle exercise; the bland authority of old ale; the pleasure of sound company; all these combine to make me feel, with Falstaff, "Shall I not take mine ease in mine inn?"



